BIOGRAPHICAL SKETCH

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NAME	POSITION TITLE
John McDaniel	Health Science Specialist
eRA COMMONS USER NAME (credential, e.g., agency login)	Cleveland VA Medical Center Assistant Professor- Kent State University
JOHNMCDANIEL	Department of Exercise Science

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	YEAR(s)	FIELD OF STUDY
Malone College	BS	1998	Exercise Science
University of South Carolina	MS	2001	Exercise Physiology
University of Utah	PhD	2009	Exercise Physiology
Salt Lake City VA Medical Center	Post-doc	2008-2011	Geriatric Research

A. Personal Statement

My expertise is highly complementary to the current study goals of assessing the effect of muscle composition on tissue resilience under load in individuals with spinal cord injury and I look forward to collaborating on this project. My research is focused on understanding factors that are responsible for poor blood flow regulation and tissue perfusion in a variety of populations including healthy older individuals, as well as those with heart failure, heart transplants and spinal cord injuries. To this end I employ several paradigms including passive exercise, active exercise and blood flow occlusion to study vascular health and to determine methods to maximize blood flow and tissue perfusion and ultimately maintain vascular and tissue health. My research background provides me with tremendous experience measuring peripheral blood flow, tissue perfusion, vascular health and vascular dilatory capacity utilizing Doppler/ultrasound and NIRS technology which are highly relevant to the current study.

1) Wray D.W., M.A. Witman, S.J. Ives, **J. McDaniel,** J.D. Trinity, J.D. Conklin, M.A. Supiano, R.S. Richardson. Does Brachial Artery Flow-Mediated Vasodilation Provide a Bioassay for NO? Hypertension, 62(2):345-51, 2013.

2) **McDaniel, J**, S. Ives, and R.S. Richardson. Muscle Length Dependent Changes in Human Blood Flow. *J Appl Physiol,* 112(4): 560-5, 2012.

3) Venturelli M, Amann M, Layec G, **McDaniel J**, Trinity JD, Fjeldstad AS, Ives SJ, Yonnet G, Richardson RS. Passive leg movement-induced hyperaemia with a spinal cord lesion: evidence of preserved vascular function. Acta Physiol (Oxf), 210(2) 429-439, 2014.

4) **McDaniel, J**., M.A. Hayman, S.J. Ives, A.S. Fjeldstad, J.D. Trinity, D. Walter Wray and R.S. Richardson. Attenuated Exercise Induced Hyperemia with Age: Mechanistic Insight from Passive Limb Movement. *J Physiol*, 588(15): 4507-17, 2010.

B. Positions

Positions and Employment

2010- Present	Health Science Specialist, Cleveland VA Medical Center
2010-Present	Assistant Professor, Department of Exercise Physiology, Kent State University
2008- 2010	Special Fellow, Geriatric Research Education & Clinical Center, VA Medical Center, SLC UT
2003-2005	Research Assistant, The Orthopaedic Specialty Hospital, Murray, Utah
2000-2002	Exercise Physiologist, Lexington Medical Center, Lexington South Carolina
1999	Exercise Physiologist, Carolina Heart Center, Columbia, South Carolina

Other Experience and Professional Memberships

2005-present Member of the American College of Sports Medicine
2009-present Ad Hoc reviewer for:
Journal of Applied Physiology
Medicine and Science in Sports and Exercise
International Journal of Sports Medicine
Journal of Biomechanics

C. Contributions to Science

1. Recently, colleagues and I embarked on a series of 8 investigations on the hyperemic response to passive exercise. The impetus behind these investigations was to partition the contributors to exercise induced hyperemia to help determine which factors are responsible for reduced blood flow with age and disease. The few previous reports suggested that passive limb movement did not induce a hyperemic response. However, our series of studies starting with healthy individuals consistently showed a transient increase in blood flow at the onset of passive limb movement. This hyperemic response is due to both central (ie increased heart rate, stroke volume, cardiac output and mean arterial pressure) and peripheral (ie. Mechanical induced vasodilation, flow mediated dilation, afferent feedback from muscle mechanoreceptors) mechanisms. This hyperemic response was also observed, but slightly reduced, in older individuals as well as those with heart failure, heart transplant and SCI. Furthermore, the contributions from peripheral and central mechanisms varied between populations. I have served as the primary investigator or co-investigator on all of these studies.

   a. **McDaniel, J**., M.A. Hayman, S.J. Ives, A.S. Fjeldstad, J.D. Trinity, D. Walter Wray and R.S. Richardson. Attenuated Exercise Induced Hyperemia with Age: Mechanistic Insight from Passive Limb Movement. *J Physiol*, 588(15): 4507-17, 2010.

   b. **McDaniel J**. Fjeldstad A, Ives S, Hayman M, Kithas P, Richardson R. Central and peripheral contributors to skeletal muscle hyperemia: The initial and steady state responses to limb movement. *J Physiol,* 101 (1):76-84, 2010.

   c. **McDaniel, J**, S. Ives, and R.S. Richardson. Muscle Length Dependent Changes in Human Blood Flow. *J Appl Physiol,* 112(4): 560-5, 2012.

d. Hayman, M.A., J. Nativi, J. Stehlik, **J. McDaniel**, A.S. Fjeldstad, S.J. Ives, D.W. Wray and R.S. Richardson. Understanding exercise induced hyperemia for central and peripheral responses to passive limb movement in heart transplant patients. *Am J of Physiol – Heart and Circ Physiol*, 299(5):H1653-9, 2010.

2. Based on our previous reports indicating passive limb movement does in fact initiate a transient hyperemic response, we continued to pursue this line of questioning to determine if passive movement could be used as a rehabilitation tool for those with SCI or other bedridden conditions. Specifically, periodic increases in blood flow to the tissues of the lower limbs could help maintain vascular health, tissue perfusion and reduce complications in these populations including pressure ulcers. These studies revealed that bouts of passive exercise induced a 100-150% increase in blood flow in individuals with SCI and able bodied individuals with an afferent spinal block. Furthermore, our most recent data (in prep) suggests that the transient hyperemic response is repeatable and therefore could be used as a rehabilitation modality in SCI and other bed ridden populations to periodically increase blood flow to the lower limbs which will ultimately help maintain tissue perfusion, vascular health and may reduce complications such as pressure ulcers in these populations.

a. Trinity JD, **J. McDaniel**, Venturelli M, Fjeldstad AS, Ives SJ, Witman MA, Barret-O'Keefe Z, Amann M, Wray DW, Richardson RS. Impact of Body Position on Central and Peripheral Hemodynamic Contributions to Movement-Induced Hyperemia: Implications for Rehabilitative Medicine. *Am J Physiol - Heart Circ Physiol*, 300(5):H1885-91, 2011.

b. Venturelli M, Amann M, Layec G, **McDaniel J**, Trinity JD, Fjeldstad AS, Ives SJ, Yonnet G, Richardson RS. Passive leg movement-induced hyperaemia with a spinal cord lesion: evidence of preserved vascular function. Acta Physiol (Oxf), 210(2) 429-439, 2014.

c. Trinity JD, **J. McDaniel**, Venturelli M, Fjeldstad AS, Ives SJ, Witman MA, Barret-O'Keefe Z, Amann M, Wray DW, Richardson RS. Impact of Body Position on Central and Peripheral Hemodynamic Contributions to Movement-Induced Hyperemia: Implications for Rehabilitative Medicine. *Am J Physiol - Heart Circ Physiol*, 300(5):H1885-91, 2011.

d. Venturelli M., M.K. Amann, **J. McDaniel**, J.D. Trinity, AS Fjeldstad, R.S. Richardson. Central and peripheral hemodynamic responses to passive-limb movement: the role of arousal. *Am J Physiol - Heart Circ Physiol,* 302(1): H333-9, 2012.

3. There is a wealth of data that indicates oxidative stress is detrimental to tissue/cell health. In addition, free radicals have also been implicated for endothelial dysfunction via binding to NO. While working in my former laboratory, I was involved in a series of 9 independent studies that focused on the role of oxidative stress on endothelial function and blood flow in a variety of healthy and diseased populations. In general, elevated levels of oxidative stress resulted in reduced vasodilation following blood flow occlusion (FMD) and during exercise ultimately resulting in reduced blood flow. Vasodilatory capacity and blood flow, however, is reversed with acute antioxidant consumption. We are just now starting to investigate whether chronic antioxidant supplementation provides the same benefits. I was a primary or co-investigator on these projects, and the primary investigator on a CDA-2 which helped fund some of these projects.

a. Wray, D.W., **J. McDaniel**, M.A.H. Witman, S. Ives, A.S. Fjeldstad, and R.S. Richardson. Acute Reversal of Endothelial Dysfunction in the Elderly Following Antioxidant Consumption. *Hypertension*, 59(4): 818-24, 2012.

b. Wray D.W., M.A. Witman, S.J. Ives, **J. McDaniel,** J.D. Trinity, J.D. Conklin, M.A. Supiano, R.S. Richardson. Does Brachial Artery Flow-Mediated Vasodilation Provide a Bioassay for NO? Hypertension, 62(2):345-51, 2013.

c. Witman, M.A., A.S. Fjeldstad, **J. McDaniel**, S.J. Ives, J. Zhao, Z. Barrett-O'Keefe, J.N. Nativi, J. Stehlik, D.W. Wray, R.S. Richardson. Vascular Function and the Role of Oxidative Stress in Heart Failure, Heart Transplant, and Beyond. *Hypertension*, 60(3):659-68, 2012.

d. Wray, D.W., M.A.H. Witman, S. Ives, **J. McDaniel**, A.S. Fjeldstad, J.D. Trinity, J. Conklin, M. Supiano, and R.S. Richardson. Progressive Handgrip Exercise: Evidence of Nitric Oxide-dependent Vasodilation and Blood Flow Regulation in Humans. *Am J Physiol - Heart Circ Physiol*, 300(3):H110-7, 2011.

Complete List of Published Work in MyBibliography:
http://www.ncbi.nlm.nih.gov/myncbi/collections/bibliography/46217461/

D. Research Support

Current projects

VA RR&D SPiRE award **5/1/2015-4/30/2017**
Exercise to Improve Blood Flow and Vascular Health in the Lower Limbs of SCI.
The goal of this project is to determine how upper body exercise and lower limb passive movement alters blood flow and tissue perfusion in the lower limbs of those with SCI.
Role: Principal Investigator

Spinal Cord Injury Research Program, CDMRP **9/30/2014-9/29/2017**
Development of a Personalized Model for Pressure Ulcer Prevention Acutely Following Spinal Cord Injury: Biomarkers of Muscle Composition and Resilience
This study will develop an initial valid model of biomarkers for pressure ulcer development risk acutely following SCI.
Role: CO-I (PI: Kath Bogie)

Craig H. Neilsen Foundation **1/1/2015-12/31/2016**
Development of a Personalized Pressure Ulcer /Deep Tissue Injury Risk Tool
The project will use an applied research case-control study design to develop and test a new outcome tool for pressure ulcer and deep tissue injury risk assessment for individuals with long-standing SCI
Role: Co-I (PI: Kath Bogie)

Completed projects

VA RR&D Career Development Award, Level-2 No. **10/20/2010-10/20/2014**

Muscle Function and Vascular Health in the Elderly Population: The Role of Chronic Antioxidant Supplementation.
The goal of this project is to determine the influence of chronic antioxidant supplementation on markers of oxidative stress and antioxidant capacity in healthy older individuals. In addition, we aim to determine if chronic antioxidant supplementation reduces the muscle and vascular dysfunction typically observed in the elderly population.
Role: Principal Investigator

Single Leg Cycling: Implications for Cardiac Rehabilitation **6/1/2012-6/1/2013**
Kent State University Research Council
Role: Mentor

College of Health, Collaborative Research Award. **6/1/2008-6/1/2009**
Passive Movement as a Rehabilitative Tool for Immobile Patients Including Those with Spinal Cord Injuries.
The goal of this project was to help determine the efficacy of passive exercise as a rehabilitative tool to stimulate blood flow in spinal cord injured subjects.
Role: Principal investigator

University of Utah, Center on Aging **1/1/2010 – 1/1/2011**
Antioxidants and Muscle Function in the Elderly Population
The goal of the project was to determine the influence of acute antioxidant supplementation on blood flow during exercise and vascular function in the elderly population.
Role: Principal Investigator